VASQUEZ BOULEVARD / INTERSTATE 70 (VB/I-70) SITE

TECHNICAL MEETING OF THE WORKING GROUP ON RESIDENTIAL SOIL SAMPLING DESIGN

WEDNESDAY MAY 19, 1999
PROPOSED DISCUSSION

MEETING OBJECTIVES: EPA is seeking input from technical working group members on the design of a residential soil sampling study to be implemented in July, 1999.

BACKGROUND: The last meeting of the full VB/I-70 working group was held on May 6, 1999. At that meeting, two aspects of the residential soil sampling design were identified as requiring further in depth technical discussion; the basis for the number of samples to be collected in each yard and the need for sampling below a depth of 2". This meeting was scheduled to provide a forum for such a discussion.

The residential soil sampling study will be designed to collect sufficient data to characterize exposure pathways associated with off-facility soils (see the draft Conceptual Site Model). Exposure pathways associated with on-facility soils will be characterized in a separate phase of EPA's investigation which will begin at a later date.

Issue #1: What is the basis for the number of samples to be collected in each yard?

Sampling will be designed to provide representative data for the exposure areas at the site. The exposure areas for this phase of the study are assumed to be the individual residential yards. The relevant statistical parameter for lead risk assessment is the average concentration within the yard. The relevant statistical parameter for arsenic risk assessment is the 95% upper confidence limit on the arithmetic mean concentration within the yard.

The hypothesis selected for the test is:

Null hypothesis: The mean concentration of arsenic or lead within a yard is below a level of concern.

Alternative hypothesis: The mean concentration of arsenic or lead within a yard is above a level of concern.

EPA is relying substantially on the results of the Risk-Based Sampling Study for information about the distribution and variability of metals concentrations within residential yards. For today's discussion, EPA will focus on arsenic only. Using this data and computer simulations, EPA generated probability curves for two locations, one "impacted" property, and one "unimpacted" property.

EPA recommends the following minimum statistical performance parameters for Risk Assessment:

- **20% chance of false positive**
- **10% chance of false negative**

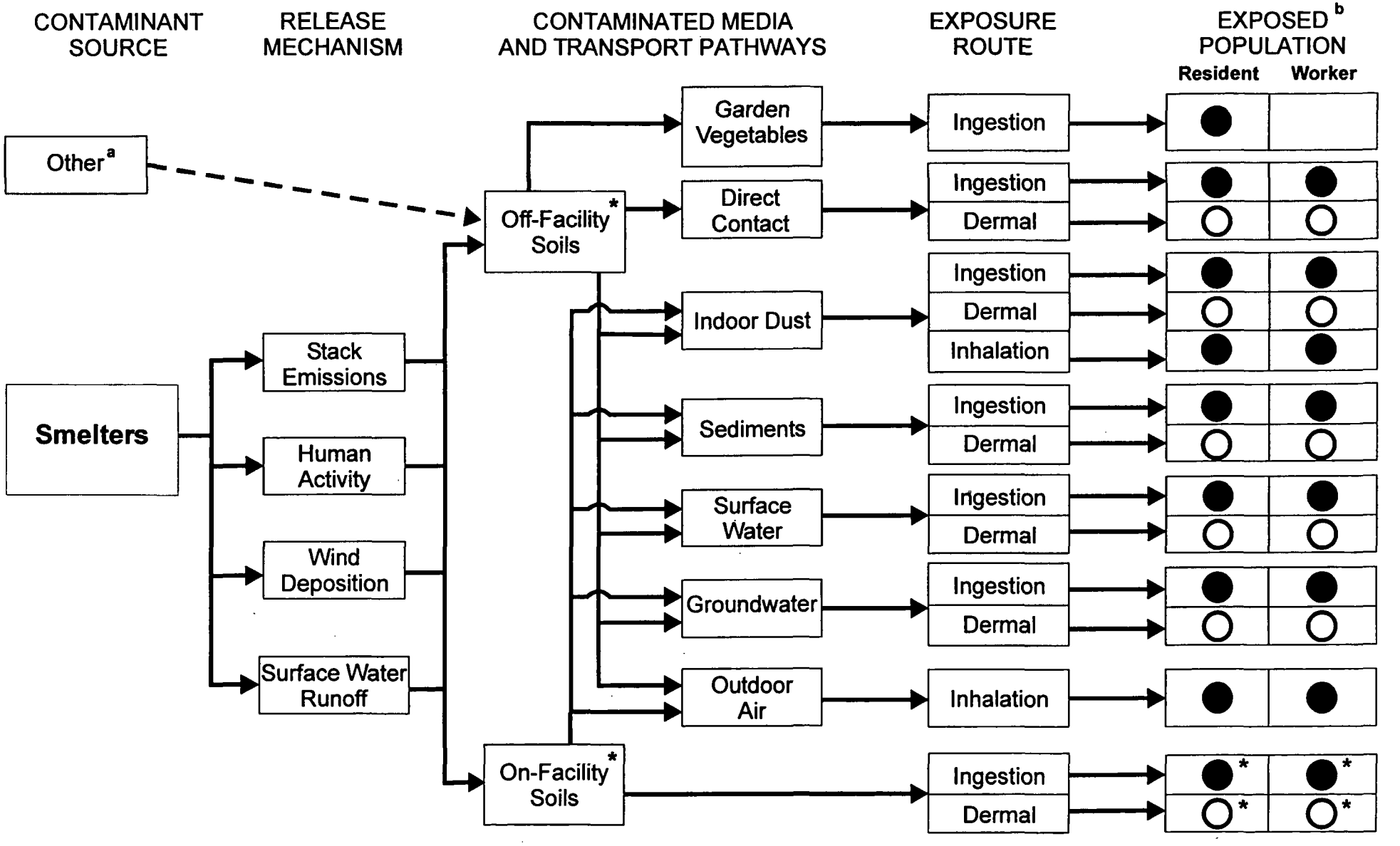
The probability curves will be the focus of the discussion about an appropriate number of samples per yard to achieve the required performance. Fro the VB/I-70 site, EPA has chosen to design the soil study to achieve a 5% chance of a false negative in order to address concerns about protectiveness. As can be seen, this is more conservative that standard EPA recommendations.

With this design, when EPA declares that a property is below a level of concern, there will be less than a 5% chance it is really above a level of concern. Also, if EPA declares a property is above a level of concern, there is less than a 20% chance that the property is really clean.

Issue #2: Is subsurface sampling necessary?

Using all data, EPA compared the concentrations of lead, arsenic, cadmium, and zinc in the subsurface to those in the surface at each yard sampled. This comparison will be the focus of the discussion about the need to sample subsurface soils. The purpose of the comparison is to answer the question, " Is the concentration of arsenic, lead, cadmium, or zinc higher in the surface than in the subsurface?"

Draft Conceptual Site Model - Potential Human Exposure Pathways at Vasquez Blvd./I-70 Site (Revision 2)



= Pathway is not complete

= Pathway is complete, but minor; qualitative evaluation

= Pathway is complete and could be significant; quantitative evaluation

* "On-Facility" exposure is only at the former Omaha-Grant and Argo sites.

a - Other sources may be historical smelters, other active smelters & arsenical pesticides.

b - The work group will refine the lis of exposed populations as the risk assessment proceeds and additional site-specific data are obtained.